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THE PLANT DISEASE REPORTER

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Volume XXII Number 9

May 15, 1938

BUREAU OF PLANT INDUSTRY

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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XXII Number 9

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GERANIUM CRINKLE IN NEW JERSEY

P. P. Pirone

The crinkle disease of Pelargonium zonale was observed recently for the first time in New Jersey. In one greenhouse more than 400 virus-infested geraniums exhibited the characteristic irregular to circular chlorotic areas of one-half to 2 mm. in diameter on the ruffled and dwarfed young leaves, as described by Dr. Leon K. Jones[1] at the last Science Meetings in Indianapolis. The spots on the old leaves were usually circular (2-5 mm.) often with two concentric rings.

The crinkle closely resembles the curly leaf disease of Pelargonium described by Pape[2] in 1927, which is apparently rather common in England and Germany.

The disease was not found in any of several other large geranium establishments visited. An attempt to trace the original source of the diseased stock was unsuccessful, since the originators of the varieties most severely affected in the present outbreak have perfectly healthy stock plants in their greenhouses. Moreover, these growers say they have never observed the disease in their houses.

The grower has observed the disease since 1933. It was first seen on the variety Helen Mitchell, then on Ricard and is now prevalent on Olympic Red. The varieties Improved Ricard and Poitevine seem to be less susceptible, while white varieties appear to be immune.

The New Jersey disease acts similarly to that reported by Jones and by Pape in that the symptoms are masked during the summer months. Symptoms are most striking during March and April. Cuttings taken early in February appear normal and the symptoms are not visible until these plants are 6 to 8 weeks old.

Several species of insects were abundant in this greenhouse during January and February which may account for the extensive outbreak. A considerable amount of the disease was probably transmitted through the cuttings since the symptoms were masked at the time cuttings were made from the stock plants.

(New Jersey Agricultural Experiment Station, April 30).

1/ Jones, Leon K. Crinkle and mosaic of geranium. Phytopath. 28: 11. Jan. 1938.

2/ Pape, H. Das verheerende Auftreten der Krauselkrankheit bei Pelargonien. Gartenwelt 31: 329-332. 1927.

NARCISSUS MOSAIC AND EARLY MATURITY

Frank P. McWhorter

During the past few years, the mosaic content of the better narcissus varieties in the average Northwest plantings has been reduced to percentages between zero and two percent. Even such varieties as Talma and Sir Watkin wherein the mosaic contents of imported stocks were as high as 98 percent are now grown in commercial plantings almost entirely free from this virus infection. Blocks of King Alfred several acres in extent are now available wherein the mosaic content would be rated as "a trace". These statements apply to the true mosaic, which produces greenish blotches in the leaf surface that are emphasized by "blue island" remnants of the original color. Further, the greenish areas are always roughened because the virus effect that modifies the leaf structure exhibits its greatest activity within the epidermal areas.

While this eradication of the true or typical mosaic has been in progress another condition has developed which leads to early maturity and therefore engenders a degenerative effect. Plants that decline or mature early exhibit various striking symptoms such as purple streaking or white streaking. Sometimes the terminal areas of the leaves break down into a condition called "paper tips". The markings are entirely different from those characteristic of mosaic and are not accompanied by the epidermal modifications characteristic of the typical mosaic. During the past five years the incidence of this symptom complex leading to early maturity has increased from a trace to as high as 7 percent. Plants so marked become conspicuous immediately after flowering and may mature thirty to sixty days ahead of the normal period.

An extensive study is in progress to try to find the cause and origin of this condition. The most virulent expression of the white streak form of this trouble that the writer has seen is present in 1937 imports of the King Alfred variety from Holland. The following table compares 1937 importations with some well established Northwest stocks of King Alfred:

	Percentage of			
	White streak	Paper tip	Purple streak	Mosaic
GROWER A				
Home grown mother block	2.5	0.0	2.5	0.5
Commercial stock	2.7	2.5	4.5	0.1
Imported Holland stock	2.5	2.8	4.0	3.0
GROWER B				
Imported Holland stock	8.0	0.0	0.0	8.0

The Holland stock received by Grower A was considered exceptionally fine. That received by Grower B was considered average to poor. Unfortunately a fire destroyed all of Grower B's original planting stock so a direct comparison with the imported stock is not possible. The figures in this table are not intended to suggest a point of origin for the decline condition. They do show, however, that the decline condition may be expected in narcissus wherever they are grown.

As stated above, we do not know what may be the cause of this early maturity trouble. It may be of virus origin, or related to some elemental deficiency or to some asexual aberration accrued during bulb propagation. The condition is prevalent in the older varieties. Observations on more than 2,000 individuals have proven that it becomes fixed within clone units. Immediate control may therefore be effected through roguing.

(Oregon State Agricultural College and Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry).

FURTHER NOTES ON THE DISTRIBUTION OF THE WITCHES'-BROOM OF BLACK LOCUST

John A. Stevenson

While studying recently at the New York Botanical Garden, opportunity was had to examine material of Robinia pseudoacacia in the phanerogamic herbarium, with the result that three clearly marked specimens of the witches'-broom disease were found. The first was collected by the late J. K. Small at Marysville, Perry County, Pennsylvania, probably prior to 1900, the collector noting "defective leaves". Doctor Small also obtained a second specimen at Toccoa Falls, Georgia, in July 1896, and Dr. Theodore J. Grant notes that this is the earliest known collection for this State. The third specimen was from the collections of W. H. Camp, on Hannah Mountain, Great Smoky Mountains National Park, Tennessee, June 1936, the collector noting "This condition mostly on young plants up to six feet high". Doctor Grant points out that this latter collection establishes the first known case of the disease in Tennessee. [See also Reporter 22: 28-31].

(Division of Mycology and Disease Survey).

REPORTS ON APPLE SCAB

MASSACHUSETTS: Review of Scab Spore- and Tree-Development to Date. Both scab [Venturia inaequalis] spore growth and tree development started unusually early this spring owing to the abnormally warm weather

during the last eleven days of March (with mean maximum temperature of 57°+F for that period). Then, continued warmer-than-normal weather throughout April hastened fruit bud development in orchards at both high and low elevations, but scab spore development lost pace due to prevailing dry weather. Orchards in the Connecticut Valley were ready for the delayed dormant spray on April 11-14, and such varieties as McIntosh and Baldwin were in pre-pink on April 19-23, whereas normally they do not reach that stage before May 1-3.

Fruit buds went rapidly through the pink-bud stage on April 24-30, and were in early bloom on May 1-3, compared with May 10-12 for the normal early-bloom period. At present, the calyx spray is started in Amherst orchards, a majority of the petals on McIntosh being down. Usually, this spray begins around May 18-20. Tree development is still at least ten days earlier than normal and nearly two weeks earlier than in 1937.

Scab Development and Infection Periods. Other than the twenty-four-hour rain of April 18-19, when inland low-elevation orchards were in the early pre-pink bud stage, and the two-day period of intermittent showers on April 29-30 (late pink), only an occasional shower has occurred. In fact, more than half of the scab spore load is still in the old leaves. The comparatively dry weather has not only delayed spore maturity but it delayed spore discharge as well, so that there is at present an accumulation of mature spores to be shot following the blossom period.

Scab Now Present. New foliage spots of scab were first observed by W. H. Thies today (May 9) in the check McIntosh and Baldwin trees of the college spray-materials test. This represents infection during the all-day-and-night rain of April 18. Judging from the appearance of the spots, they were observable on May 6-7. Hence the incubation period was shortened from the usual 20-21 days to 18 days, due no doubt to the unusually mild weather following the date of infection. No infection was found on trees in the same block that received the pre-pink spray of lime-sulfur on April 23. The spots are mostly confined to the under surface of the second, third, and fourth spur leaves, more numerous however on the third and fourth leaves; and to the under sides of the first three leaves on the vegetative shoots. Growers who dusted or sprayed shortly before that rain or applied lime-sulfur within two to three days after it began should have prevented the infection. (O. C. Boyd, May 9, Massachusetts State College).

RHODE ISLAND: (Week of April 23-29). The perithecia are full of spores and the least rainfall will cause a heavy spore discharge. Some varieties are in very late pink while others are in the early pink with the individual blossom buds remaining stuck together.

(Week of April 30 - May 6). From 20 to 50 percent of the spores have been shot. McIntosh buds were in late "pink" until May 4 when the blossoms opened at both Greenville and Kingston. At Portsmouth the buds were in late "pink" on May 4 although the petals of the central blossom of the cluster were open in some cases. (Frank L. Howard, Rhode Island Agricultural Experiment Station, May 7).

NEW YORK: (From Weekly News Letter, May 9). Hudson Valley. The apple scab situation has not changed much in the Hudson Valley during the past two weeks because of the absence of rain. There are enough mature spores to give a heavy discharge during the next rain. (D. H. Palmiter).

Rockland County. Apple scab is beginning to show up. Found first lesions on 5th leaf of such varieties as Fall Pippins, McIntosh, and Cortland on May 5. This scab was found in an unsprayed orchard near Airmont. The spores causing this infection were probably discharged on April 18. (W. J. Clark).

Dutchess County. Apple scab observed on flowering crab on May 6. Apple scab also noted on first set of leaves on May 7 at Red Hook. (A. T. Williams).

Chautauqua County. Apple scab was first observed on the under sides of leaves on April 26. Considerably more appeared this week. (C. K. Bullock).

Wayne County. A light apple scab infection is now showing on unsprayed McIntosh on the under side of the first leaves in the blossom cluster. Apparently this infection occurred during the delayed dormant period. (M. E. Buckman).

IDAHO: On overwintered apple leaves from Clarks Fork, mature spores of Venturia inaequalis were found on April 20. (Earle C. Blodgett, May 5. Idaho Agricultural Experiment Station).

OTHER REPORTS ON FRUIT DISEASES

NEW YORK: (From Weekly News Letter). Cedar rusts. In the Hudson Valley apple and quince rust [Gymnosporangium juniperi-virginianae and G. clavipes] galls on the cedar trees are fully mature now and ready to give an abundant discharge of spores during the next rain period. (D. H. Palmiter, May 7). Rockland County---The first cedar rust infection was found May 5 on Rome leaf (W. J. Clark). Dutchess County---Apple rust observed on flowering crab on May 6. (A. T. Williams). Greene County---There still appears to be inoculum of apple, hawthorn [G. globosum], and quince rust on the cedars. (E. G. Brougham).

Peach leaf curl [Taphrina deformans] was noted in Wayne County, April 20. (M. E. Buckman).

Cherry leaf spot [Coccomyces hiemalis]. In the Hudson Valley ascospores of the cherry leaf spot fungus are approaching maturity. One leaf out of 25 gave a discharge when wet in the laboratory. (D. H. Palmiter, May 7). In Wayne County a number of cherry orchards which were very seriously affected with leaf spot last year are showing many trees weakened and some dead trees as a result of winter killing. (M. E. Buckman).

IDAHO: Unsprayed peach trees at Myrtle were almost 100 percent infected by leaf curl, Taphrina deformans, on April 27.

Injury by Coryneum blight, Coryneum beijerinckii, was very severe on unsprayed peach and apricot trees and on Prunus emarginata at Myrtle, April 27. Leaf spotting and twig cankering were serious.

A storage rot of Jonathan apples caused by Gloeosporium perennans was abundant on fruit grown at Coeur d' Alene. Even more serious injury was noted (May 1) on Rome Beauty and seedling apple fruits grown at Moscow and kept in common storage. (Earle C. Blodgett, May 5, Idaho Agricultural Experiment Station).

RUSTS ON SMALL GRAINS IN THE SOUTHERN PLAINS REGION

Reports from the Southern Plains States quoted in this and earlier issues of the Reporter all mention unusually early appearance this year of wheat leaf rust (Puccinia rubigo-vera tritici), stem rust (P. graminis), and crown rust (P. coronata).

The dates and places of first appearance of these rusts, reported thus far, are shown on Figure 1. Weather conditions for each month from December to April as compared with normal are summarized in Figures 2 to 6, which are adapted from the monthly temperature and precipitation charts given in the Weekly Weather and Crop Bulletin.

From Texas I. M. Atkins reports as follows:

(May 4) "Meteorological data recorded during April were as follows: Maximum temperature 88, minimum 30, mean 62.3°F. Precipitation 2.74. Mean temperature for the month was about 1 degree below normal and precipitation about one inch below normal. Following the excessive precipitation of February and March, the precipitation received was more than adequate. During the last half of April heavy dews were recorded on 12 days.

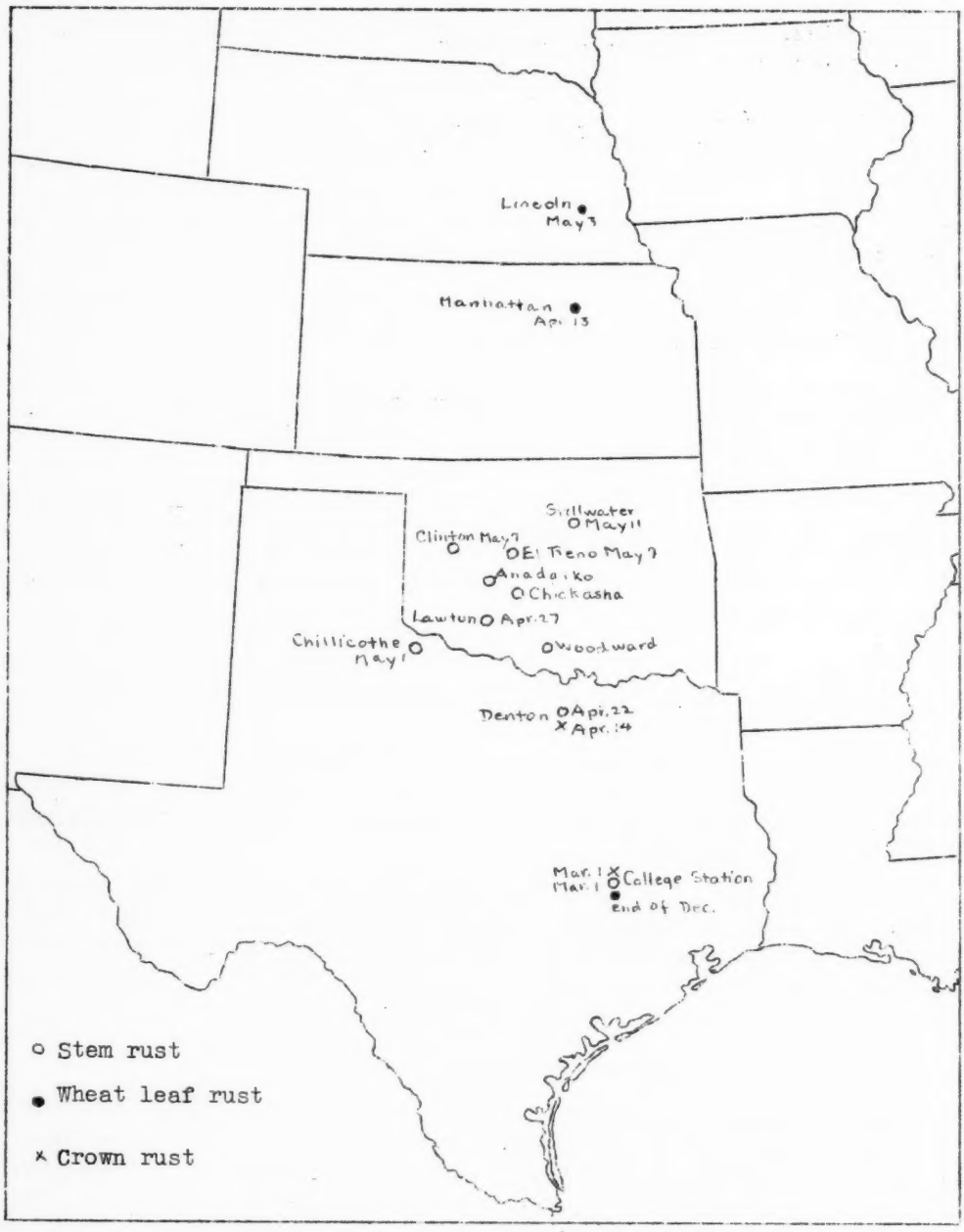

Fig. 1. Dates and places of first appearance of stem rust, wheat leaf rust, and crown rust, in 1938.

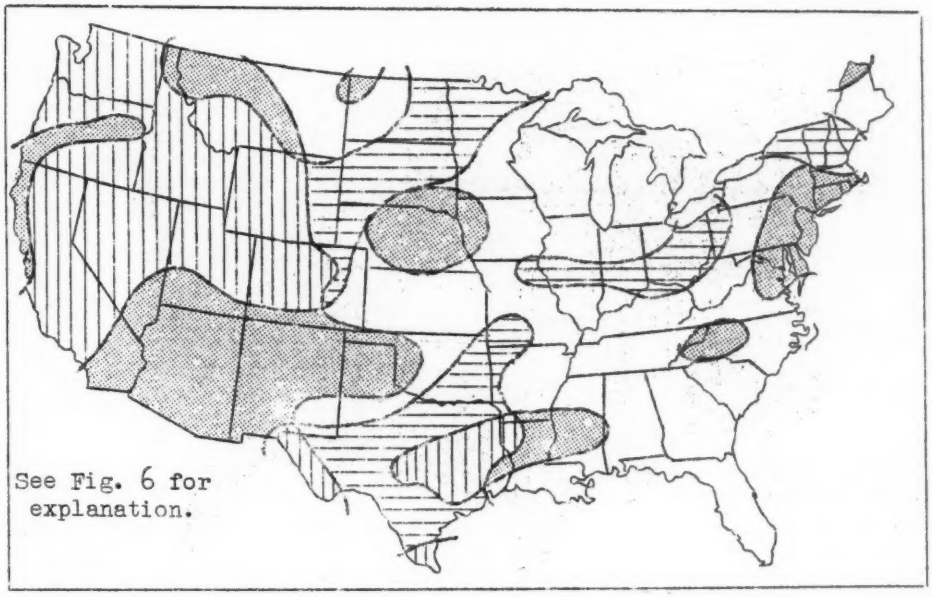

Fig. 2. Temperature and precipitation compared with normal for December 1937.

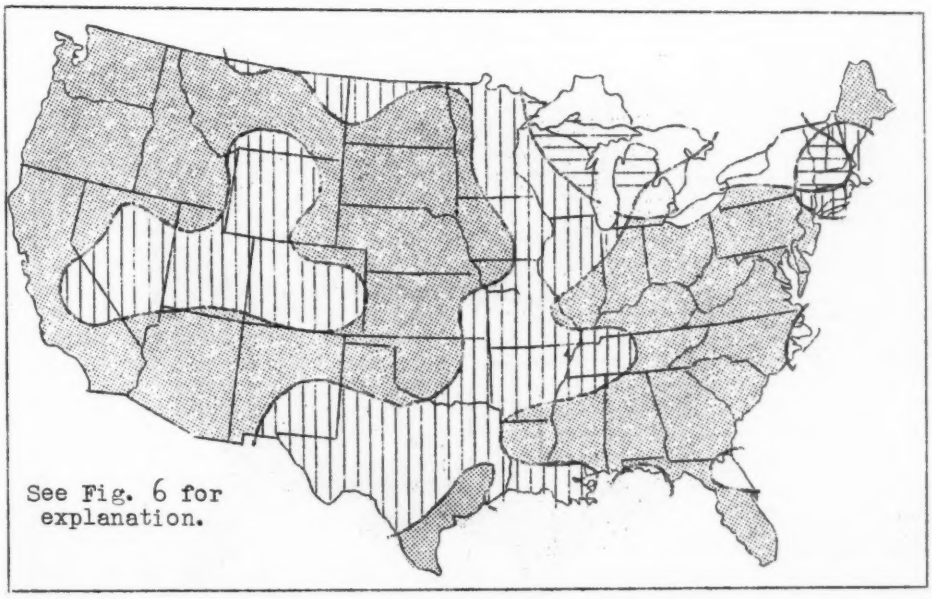

Fig. 3. Temperature and precipitation compared with normal for January 1938.

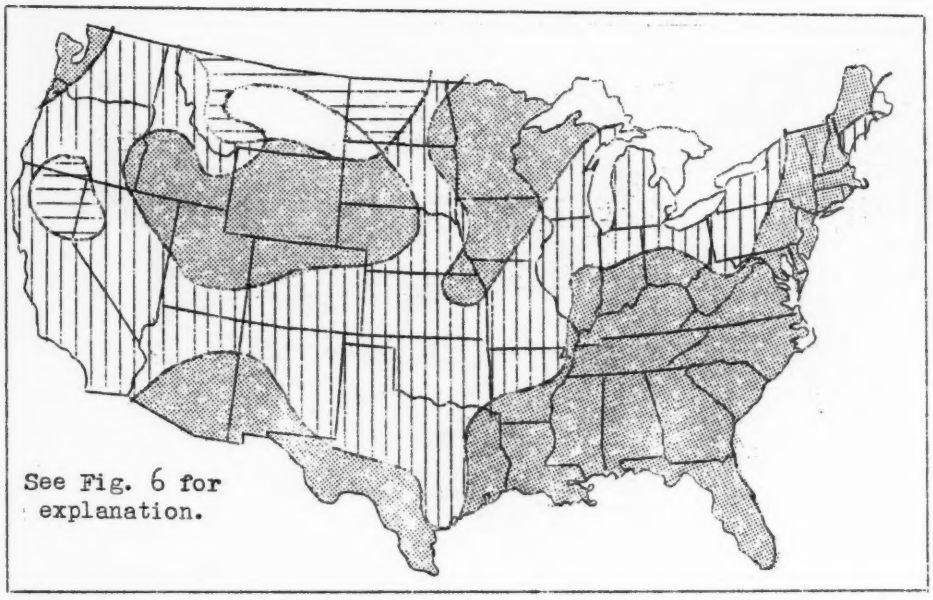

Fig. 4. Temperature and precipitation compared with normal for February 1938.

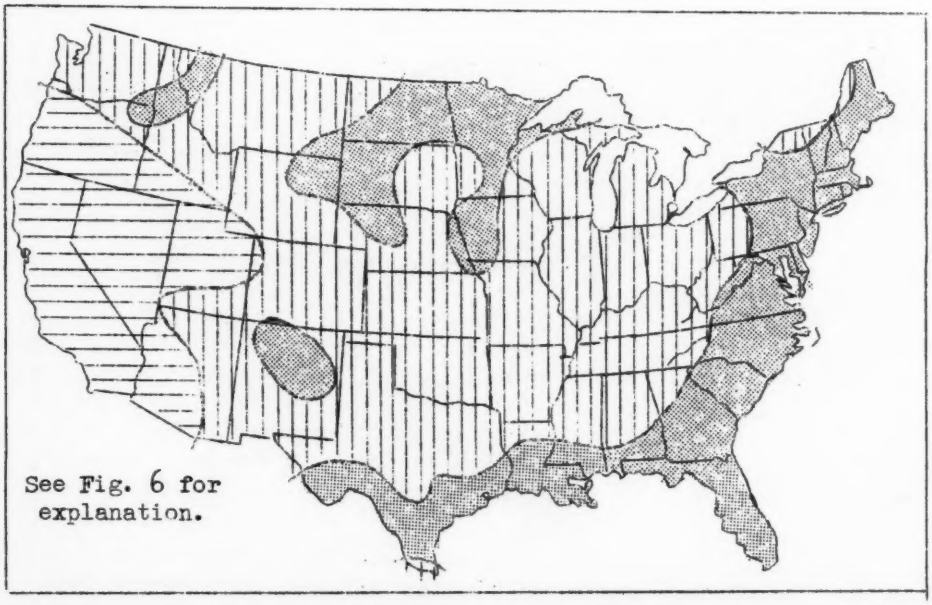

Fig. 5. Temperature and precipitation compared with normal for March 1938.

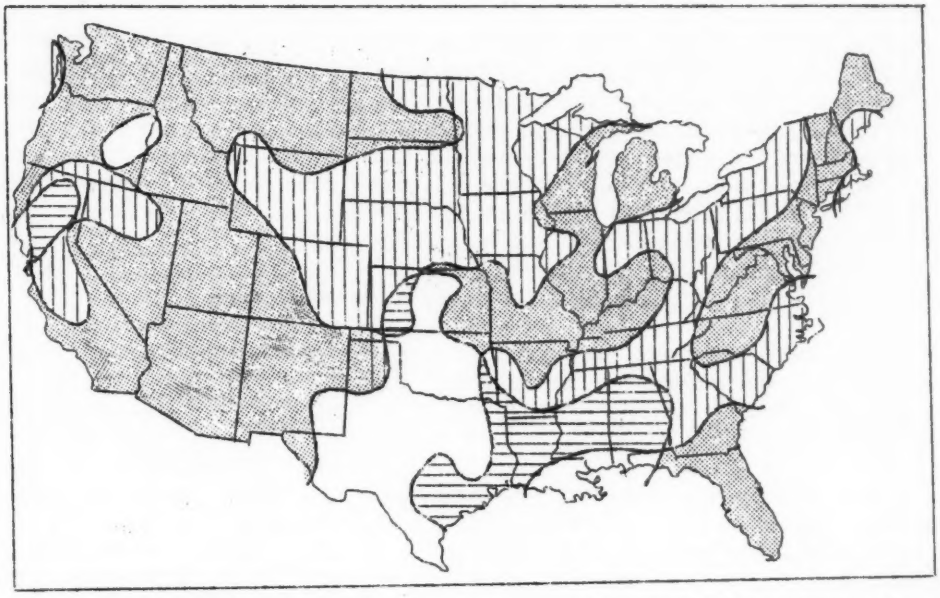
Precipitation and temperature both below normal.
Precipitation above, temperature below normal.
Precipitation below, temperature above normal.
Precipitation and temperature both above normal.

Fig. 6. Temperature and precipitation compared with normal for April 1938.

"As a result of the above conditions, small grains have been beset by nearly everything that could attack the crop. In spite of these factors, the crop has made rapid progress and at present looks good. Nearly all grains have completed heading, while early strains of barley are starting to ripen.

"Wheat on farms in this vicinity is very spotted in appearance. Some fields look good but many are yellow from rust and lack of nitrogen, as a result of excessive rains. Experimental wheat at the station is in good condition at this writing. Although leaf rust is still doing considerable damage, the crop has gained the upper hand during the heading period. Early varieties such as Missouri Early Premium, and hybrid strains from the cross (P.1066 x Prelude) x Tenmarq are approaching the ripening stage. Very late varieties are just starting to head. A few of the very early varieties were injured some by the freeze, portions of the head being sterile. The stem rust situation at this time looks rather serious. Stem rust was found on April 22 in a field near the station, and on April 25 at the station. This is about 8 days earlier

than we have ever found it in this area. Since then, stem rust has spread and now can be found in any field in this area. Infection was found as far north as Sherman, Texas last week and one sample from the Chillicothe, Texas Substation was received May 1. After the first pustules were found, further search revealed several areas where the teliospore stage had been reached. These pustules were near the base of the plant and may indicate that the disease overwintered in this area. Further spread of the disease will of course depend upon weather conditions. At this writing (May 4) the wind has been blowing from the south for two days at velocities ranging from 10 to 20 miles per hour.

"The fall-sown oat crop in this area is very promising at present. Crown rust has spread rather rapidly on susceptible varieties of oats but has not attacked the Red Rustproof types yet. Some damage may occur in spring-sown oats.

"The barley crop was injured more than the other small grains by the recent freeze. Many sterile heads, or portions of the head, resulted from pollen being killed during the freeze. Barley is rapidly approaching maturity and will be ready to harvest in about 10 days. The yields will be smaller than last year's record crop because of sterility as well as rather small heads.

"Reports received from west Texas indicate that the crop is beginning to need additional moisture. The early rank growth has dissipated the moisture."

(May 9) "The small grain crop has made excellent progress during the past week. Although two small showers have been received since May 1, weather conditions in general have not been favorable for the spread of wheat stem rust. During the first part of last week strong south winds prevailed for about three days and three nights. Barley, which seems to be very weak-strawed this year, was lodged some during this period. Only one dew was recorded. During the latter part of the week very cool weather prevailed with minimum temperatures in the 40's. As a result of these conditions, stem rust of wheat seems to be little if any worse than a week ago. Crown rust of oats seems to be spreading much more rapidly than wheat stem rust. Nearly all susceptible strains in the spring nursery are becoming heavily infected. Fall-sown susceptible varieties are yellow from top to bottom with rust.

"In a trip over the small grain growing areas of the county last Saturday, in company with Dr. B. B. Bayles, we found that while stem rust is present in nearly all fields, it has not become a factor in yield as yet and the prospects are that it will not except in late maturing fields. In the east prairie section of the county, it appears that about 50 percent of the wheat is Fultz. These fields have started to ripen and while

considerable inoculum could be built up in these fields, it is not apt to injure them greatly. The west prairie section of the county appears to have little stem rust in the wheat at present. The wheat is later in maturity and is mostly Mediterranean and Tenmarq. Fall sown oats look fine."

"Leaf rust has been very severe here since early March. Turkey type susceptible wheats have hardly been able to mature. They will not make one-third the yield of resistant sorts. Leaf rust was also bad in west Texas but was reduced by the freeze. I doubt if it has been able to become important since.

"The stem rust situation in this area is definitely improved. Crown rust of oats is well on the way to become an important factor in the yield of spring oats. Some of our new resistant strains look fine under these conditions."

K. Starr Chester reported the finding of stem rust in Oklahoma, by telegram May 7. "Stem rust present around El Reno, and prevalent around Chickasha, Anadarko, and Lawton. Has been at Lawton ten days according to W. M. Osborn."

In a letter dated May 11 he writes as follows concerning the appearance of stem rust and damage from leaf rust:

"Confirming my telegram of May 7, stem rust was found to be present on that date in the vicinity of El Reno and Clinton.

"A single typical pustule was collected ten miles south of Woodward, and it is just becoming evident at Stillwater. Around Chickasha, Anadarko, and Lawton it is quite prevalent and W. M. Osborn, federal agronomist at Lawton, tells me that it has been at Lawton since April 27, by far the earliest record in his experience. A few miles south of Lawton it is sufficiently abundant so that a single handful of stalks yields scores of pustules.

"Other conditions observed on a 700-mile trip throughout the wheat sections of the State May 7, 8, 9 are as follows:

"In the southwest, particularly Tillman and Jackson Counties, the wheat has not only suffered considerable rust damage but in addition has been so seriously injured by hail, frost, army worms, and brown mites that not more than one-third of normal yield is expected. From Grady County [Lawton] to the Kansas line leaf rust is so severe that the fields are uniformly yellow throughout the whole area, The uppermost leaves having been destroyed at about the time the heads are emerging. On the average this wheat is just beginning to head.

"On the other hand, the section around Woodward is only lightly infested and as the wheat in that section is rapidly approaching maturity, serious rust damage is not expected."

Leaf rust is generally present in Kansas but so far stem rust has not been found, according to the following report from C. O. Johnston:

"Leaf rust infection is distributed over a very wide front from east to west and is present as far north as the Nebraska line. In southern Kansas, where some fields are beginning to head, infection is heavy in lowland fields. In the vicinity of Manhattan winter wheat has not yet reached the boot stage and most of the leaf rust infection is confined to the lower leaves. The disease is developing about two weeks ahead of normal. The wheat crop also is far ahead of normal in development for the time of year. In general it can be said that leaf rust is widely distributed in the State and is much earlier than usual in its development. Infection is certain to be heavy before harvest, but the early maturity of the crop may prevent severe losses.

"The growth of winter wheat in much of Kansas has been phenomenal this spring. The strangest thing about the situation is that much of the growth was made on only one or two feet of moist soil. Heavy top growth had depleted that moisture to a point where plants were beginning to suffer but widely distributed rains in the past few days have remedied that situation.

"April rainfall in the vicinity of Manhattan was only 1.41 inches which is 1.3 inches below normal. Despite the dry conditions leaf rust infection appeared on April 13 and gradually increased in amount. No stem rust has been seen or reliably reported in Kansas to date (May 6)."

From Nebraska, James H. Jensen reports that "Leaf rust was first found on May 3 in the University nursery plots at Lincoln. It is too early as yet to report damage or prevalence."

Stem rust on oats was found at Denton, Texas on May 10, according to the following report from I. M. Atkins:

"Stem rust was found in an increase field of oats on the Substation today. Three infection centers were found and they no doubt have been present for some time as the stems of the plants were very thoroughly covered with pustules. In the rush of work we have not had time to search for the disease in field plantings. No infection centers have been found in the experimental plantings."

RELATIVE PREVALENCE OF DIPLODIA ZEAE AND DIPLODIA MACROSPORA ON CORN

Howard W. Larsh

The two fungi here considered, Diplodia zeae (Schw.) Lév. and D. macrospora Earle, both cause ear rots of corn. Morphologically the two species differ chiefly in the size of their spores; those of D. macrospora being more than twice as large as D. zeae[1/]. In general their cultural characters are very similar, although D. macrospora grows much more slowly on artificial substrata than does D. zeae[2/].

The recently published work of Kinsel[2/] on the physiology of these two fungi and the observations of Hoppe[3/] made it appear desirable to secure as many isolates of D. macrospora as practicable. In the course of this work, information was obtained as to the range and prevalence of the two species, which is herein presented.

Fungi Found in Corn from Argentina 1937

In September 1937 eleven samples of corn which had been received in various shipments from Argentina were sent to us for study by O. F. Phillips, Chairman of the Board of Review, United States Bureau of Agricultural Economics, Chicago, Illinois.

From this material two hundred apparently diseased kernels were selected macroscopically and plated in petri dishes containing sterilized oats. The corn kernels were first wetted with 70 percent alcohol, then immersed in mercuric chloride (1/1000) for twenty minutes, after which they were washed in sterilized water three or four times. The fungi present were identified so far as possible and the results are given in table 1.

Table 1. Fungi found in Argentine corn in 1937

Diplodia zeae	45
Diplodia macrospora	2
Fusarium species	86
Other mold fungi	44
Sterile kernels	23
	200

1/. Eddins, A. H. Dry rot of corn. Phytopath. 20: 439-448. 1930.
2/. Kinsel, Katherine. Carbohydrate utilization by corn Diplodias. Phytopath. 27: 1119-1120. 1937.
3/. Hoppe, P. E. Intraspecific and interspecific aversion in Diplodia. Jour. Agr. Res. 53: 671-680. 1936.

It is interesting to note that the ratio of Fusarium species to Diplodia species in this series is similar to that observed by Stevens and Hoppe4/ on corn imported from Argentina, 1934-1935. The latter investigators state in an unpublished communication that they made no effort to distinguish D. zeae from D. macrospora, but listed as D. zeae all isolates with cultural characters typical of this genus. It seems then entirely possible that one or two isolates of D. macrospora may have been present in the cultures they list from Argentina and other foreign countries in Table 5 of their paper.

Relative Prevalence of the Corn Diplodias in the Southeastern United States

During late January and early February of the current year (1938) a trip through portions of Tennessee, Alabama, Georgia, Florida, North Carolina, and South Carolina for the purpose of collecting corn fungi was made by N. E. Stevens under authorization from the Division of Cereal Crops and Diseases, United States Bureau of Plant Industry. During this trip frequent collections were made of diseased cornstalks and ears of corn. These were true "random samples" in that no specific number was collected in any particular region and since the two species of Diplodia are not readily distinguishable in the field with a hand lens, there was no chance of unconsciously favoring one or the other. The collected material was examined in the laboratory and the relative prevalence of the various fungi was determined. The results are given in Table 2. Occasionally stalks were found bearing pycnidia of both species of Diplodia.

Table 2. Relative prevalence of Diplodia spp. on cornstalks in southeastern United States, 1937.

State	Diplodia zeae	Diplodia macrospora	Physalospora rhodina
Alabama	198	8	1
Florida	189	6	4
Georgia	120	0	2
South Carolina	123	0	2
Tennessee	23	1	2
	653	15	11

During the year 1930 Eddins5/ made similar observations of cornstalks in Florida. A microscopic examination of the spores borne in pycnidia on 618 stalks showed that 496 stalks were infested with D. zeae,

4/. Stevens, N. E., and P. E. Hoppe. Fungi in imported corn. U. S. Dept. Agr., Bureau of Plant Industry Plant Disease Rptr. 19: 70. 1935. (Mimeographed).

5/. Loc. cit. see footnote 1.

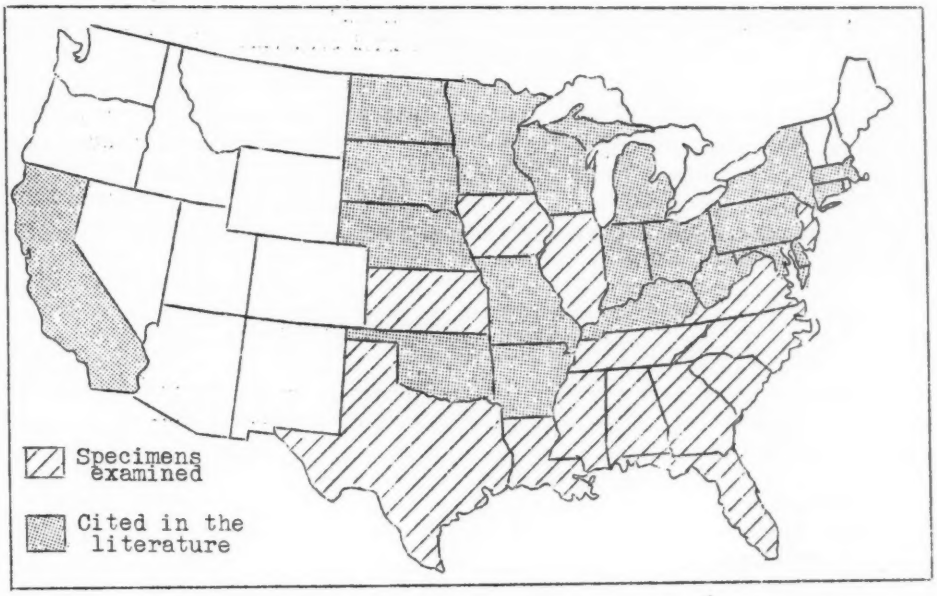

Fig. 1. Distribution of Diplodia zeae (Schw.) Lév. in the United States.

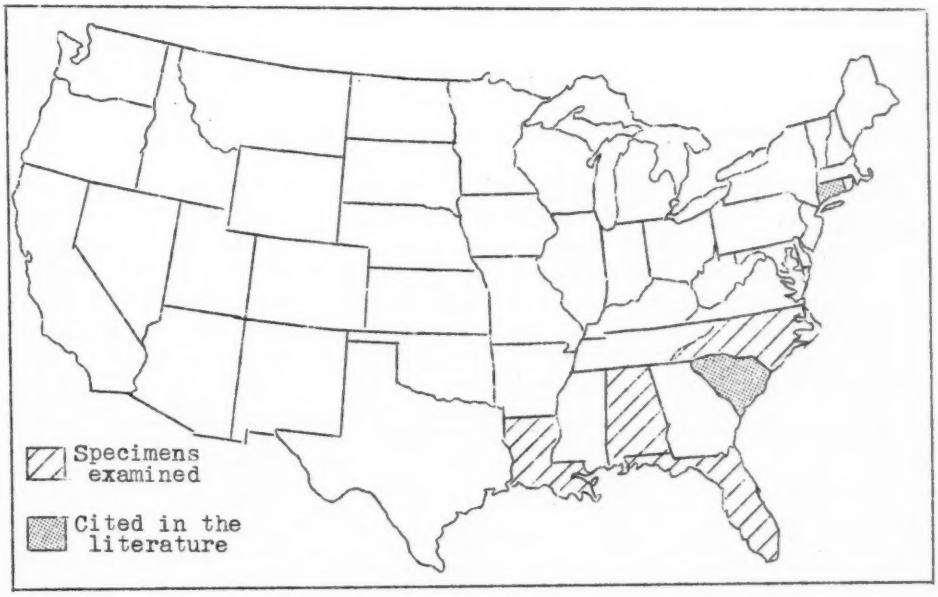

Fig. 2. Distribution of Diplodia macrospora Earle in the United States.

102 with D. macrospora, and 20 with D. frumenti, which we regard as identical with the pycnidial stage of Physalospora rhodina (Berk. & Curt.) Cke.

In addition to the determination of fungi on cornstalks reported in Table 2 cultures were made from kernels of diseased ears of corn including both those collected at the same time as the stalks and others received from G. K. Middleton, North Carolina; L. S. Mayer, Tennessee; and H. F. Stoneberg, Louisiana. The results of the cultures from diseased kernels are tabulated in Table 3.

Table 3. Relative prevalence of Diplodia spp. on corn kernels in southeastern United States, 1937

State	Diplodia zeae	Diplodia macrospora
Alabama	85	0
Florida	170	12
Georgia	55	0
Louisiana	25	4
North Carolina	25	0
Tennessee	30	0
	390	16

The known range of these two fungi in the United States is shown on the maps, Figures 1 and 2. These are based on information obtained from the records of the Plant Disease Survey, specimens in the herbarium of the Mycological Collections of the Bureau of Plant Industry and the results of our studies.

It is evident that D. zeae has not only a much wider range than D. macrospora but is much more common even within the range of the two fungi. Hoppe6/ has already called attention to the fact that D. macrospora is decidedly less pathogenic than D. zeae when inoculated into ears of corn. If both fungi were inoculated into ears of corn D. macrospora was never recovered.

(University of Illinois).

6/. Loc. cit. see footnote 3.

TOBACCO DISEASES IN KENTUCKY

Appearance and Spread of Downy Mildew (Peronospora tabacina). W. D. Valleau reported that specimens of tobacco affected with downy mildew were received on April 29 from Barren County, and on April 30 from one bed each in Daviess County, which is just across the State line from Indiana, and Barren County. Since then E. M. Johnson has reported as follows:

(May 2) "Downy mildew was found in four Burley beds in different parts of Hart County May 2. Plants were half grown to almost large enough to set. Apparently the first symptoms appeared about April 28. Two beds were injured rather seriously but few plants were dead. On the larger plants the injury was not great although the disease was well distributed in the beds. All beds were on new sites."

(May 3) "Downy mildew has appeared in plants large enough to set in Warren County and in south Todd County. Growers reported the disease to the county agents on April 29. Two of these beds visited today seem to be recovering. The injury has been negligible. One grower set a part of his crop from the affected part of the bed on April 30. The plants appear to be living as were those from unaffected parts of the bed.

"One bed visited today was affected in one end only where the disease was present in 1937. The grower probably will finish setting before it develops in other parts of the bed.

"Two beds were seen in Barren County today affected with downy mildew. Many farmers reported to the county agent that they had downy mildew. Several of these were visited but most of their beds were affected with damping off as described in the Plant Disease Reporter (21: 228. 1937). One bed developed the disease in a virulent form on April 29. Today it appears to be definitely recovering. The grower states that it is very much better and that he will be able to set his crop in a few days. The damage to this bed has been negligible."

(May 4) "Sixty-two beds on fifteen farms in Todd County were visited today. Downy mildew was present in only 9 beds. In 5 of these there was only a trace of infection, early stage. The other 4 beds were affected as follows: 1 - Burley. Infection general (about 80 percent of plants). Stunting severe. Damage probably 20 percent. 2 - Burley. Infection general. Conidiophores just developing. Little necrosis and no stunting. Damage little or none. 3 - Burley. One end of bed (half) with general infection. Some stunting. Setting from this end will be delayed. Few infections in other half of bed. 4 - One Sucker. One end of bed (one-fourth) with general infection. Stunting rather marked but very few plants were dead. Setting will be delayed. Other three-fourths of bed has few infections. Plants in above four beds were almost ready to set."

Outbreak of Wildfire (Bacterium tabacum). "Fifty-two farmers in Franklin County reported trouble in plant beds yesterday. A sample submitted for examination, which was throught to be representative of the outbreak, proved to be wildfire." (W. D. Valleau, May 7).

BRIEF NOTES ON PLANT DISEASES

BLACK STEM OF ALFALFA IN KENTUCKY: Black stem (Phoma medicaginis) [Pleospora rehmiana] has been very destructive to alfalfa this year in all parts of Kentucky. The season has been very early and wet until recently. Stands of plants have been reduced in old plantings and the first cutting will be reduced fully 25 percent in value. (W. D. Valleau, May 7).

DOWNY MILDEW ON SPINACH IN NEW YORK: Spinach mildew [Peronospora effusa] was found in Nassau County, Long Island, on overwintered spinach, April 28. (Orson S. Cannon, from Weekly News Letter, May 2).

FROST DAMAGE TO PEACH TREES IN KENTUCKY: According to County Agent W. D. Talbert of Hart County the New Haven variety of peach was the only one that survived the frosts of April 3 and 10. A few seedlings survived. (E. M. Johnson, May 2).

LEAF BLISTER ON OAK TREES IN THE SOUTH: Paul R. Miller sent specimens of oak leaves affected with leaf blister (Taphrina coerulescens) collected at Auburn, Alabama, May 4, with the remark "This Taphrina has been so conspicuous by its universal presence in South Carolina, Georgia, and Alabama, and so severe as to attract my attention in all sections visited. Ten trees chosen at random showed every observable leaf to bear infection."

APRIL WEATHER

(From Weekly Weather and Crop Bulletin for the week ending May 3).

Figure 1 shows that April was warmer than normal over much the greater portion of the country, although the plus departures were small in most sections. The warmest weather in relation to normal occurred from the Ohio Valley eastward and northeastward in the western Lake region, and the northern Great Plains, where the month was generally 3° to 4° warmer than normal. It was relatively cool very locally in the more western States and the central and west Gulf area, although minus departures exceeded 2° at only two first-order stations.

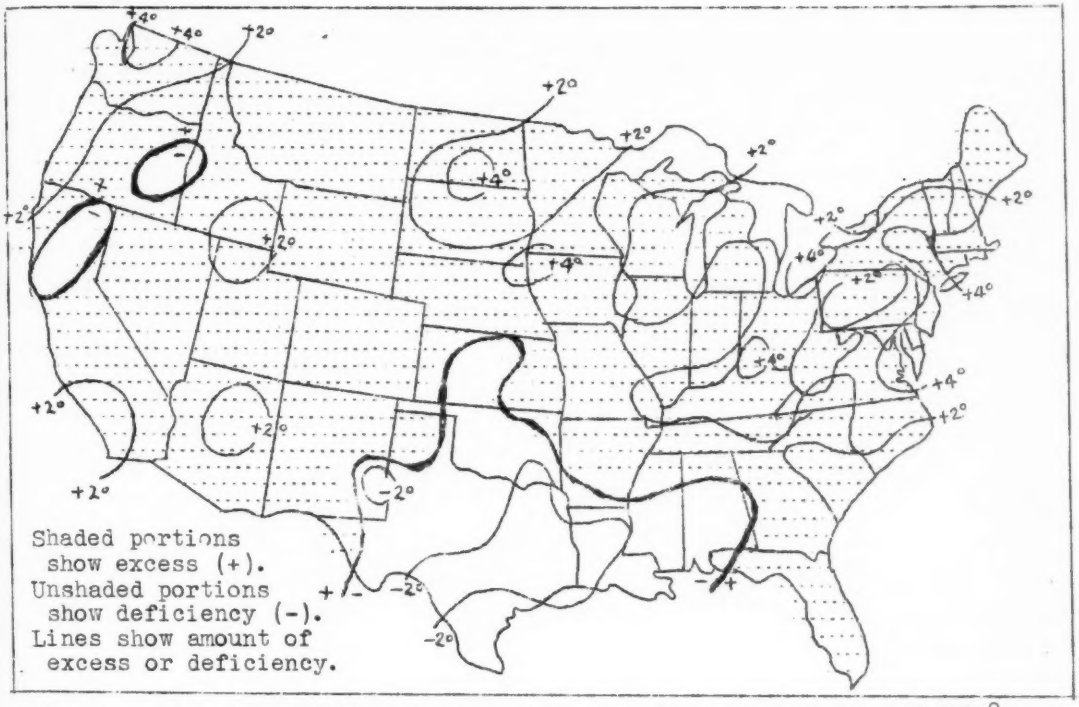

Fig. 1. Departure of Mean Temperature from the Normal for April 1938.

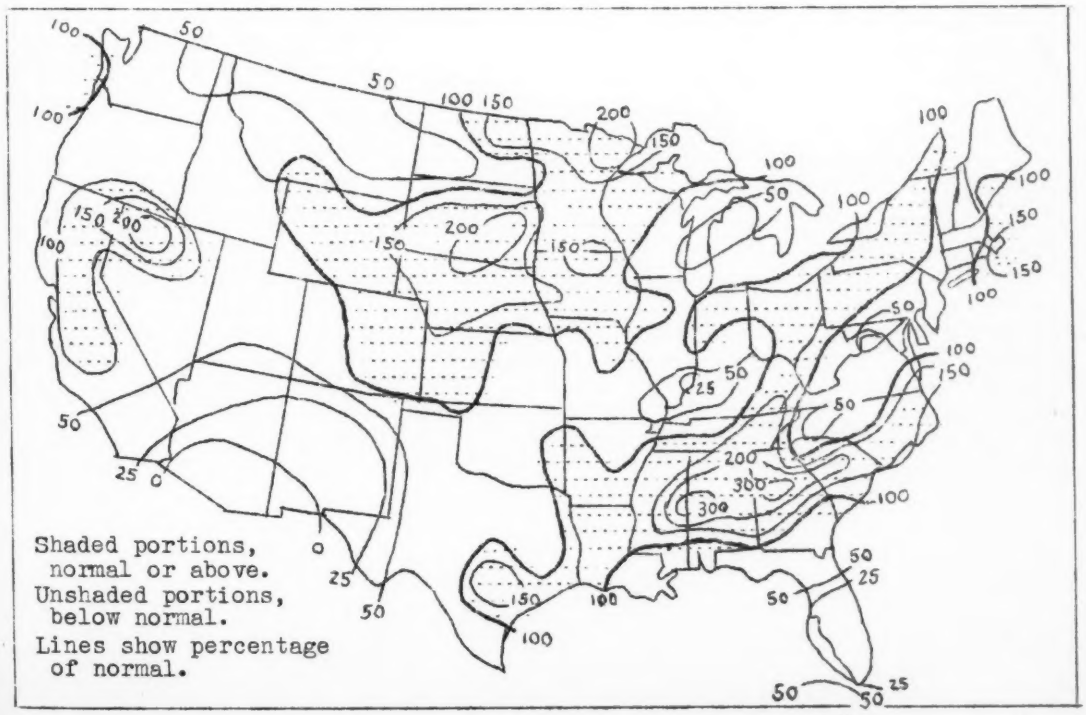

Fig. 2. Percentage of Normal Precipitation for April 1938.

Figure 2 shows that rainfall during April was very unevenly distributed. From the Great Plains eastward there was a general tendency to above normal, although a few local areas were decidedly dry, particularly in the lower Ohio Valley and parts of the Southeast. Most of the central and eastern Cotton Belt had heavy rainfall, while the amounts were generally above normal in Minnesota, Iowa, South Dakota, Nebraska, and most of Kansas. A large, far-southwestern area, including western Texas, New Mexico, and Arizona, had but little rainfall, with some stations reporting no measurable amounts during the entire month. In general, moisture was scanty in the northwestern Great Plains and in most sections west of the Continental Divide.